

North Slope of Alaska ARM Facilities Monthly Status Update Sandia National Labs

January 2017

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1 North Slope Facilities Management Executive Summary and Major Issues

This monthly report is intended to communicate the status of North Slope ARM facilities managed by Sandia National Labs.

Operations Team

- * Mark Ivey- ARM Alaska Sites Manager (SNL)
- * Fred Helsel- AMF3 Site Manager (SNL)
- * Dan Lucero- Barrow Site Manager (SNL)
- * Darielle Dexheimer- Tethered Balloon Operations (SNL)
- * Valerie Sparks- ARM Project Office (SNL)
- * Martin Stuefer- Rapid Response Team (UAF)
- * Randy Peppler- ARM DQ Office Manager (OU)

2 Budget

FY2016 Financials (as of January 27, 2017)

	November	YTD
Carryover funds	\$3,729,525	
Funds Allocated YTD	\$4,524,000	
Carryover plus YTD funds	\$8,253,525	
Cost, burdened amount	\$2,225,764	
Uncosted Funds	\$6,027,761	
Commits, burdened total	\$1,928,043	
Current fiscal year uncommitted funds	\$4,099,718	
Subsequent fiscal year (SFY)commits	\$704,414	
Total uncommitted funds, including SFY commits	\$3,395,304	
Fully Burdened Staff Costs	\$342,000	
Fully Burdened Contract Costs	\$305,000	
Fully Burdened Total Costs	\$647,000	\$2,226,000

3 Safety

AMF3- No Incident/Injury

Barrow - No Incident/Injury

4 Instrument Status – Provided by Martin Stuefer

AMF3

INFORMAL AMF3 INSTRUMENT STATUS REPORT FOR January 20, 2017 - January 27, 2017

BRIEF STATUS OF INSTRUMENTS and site IN OLIKTOK AS OF 2017/01/27:

Facilities Operational

Data Systems Operational

Vehicles Partly Operational

SKYRAD - SKY Radiometer on Stand for downwelling Operational

MFRSR - Multifilter Rotating Shadowband Radiometer Not Operational

GNDRAD - Ground Radiometer on Stand for Upwelling Operational

MFR3m - Multifilter Radiometer at 3m height Not Operational

MET - Meteorological Instruments on Tower Operational

ECOR - Eddy Correlation Flux System Operational

MWR3C - Three Channel Microwave Radiometer Partly Operational

MPL - Micropulse Lidar Operational

DL - Doppler Lidar Operational

RL - Raman Lidar Not Operational

CEIL - Vaisala Ceilometer Operational

RWP - Radar Wind Profiler Operational as per http://radar.arm.gov

KAZR - Ka ARM Zenith Radar Operational as per http://radar.arm.gov

KaWSACR - Ka-Band Scanning ARM Cloud Radar Operational as per http://radar.arm.gov

TSI - Total Sky Imager Not Operational

MASC - Multi Angle Snowflake Camera Operational

AOS - Aerosol Observing System Partly Operational

AERI - Atmospheric Emitted Radiance Interferometer Operational

CPC - Condensation Particle Counter Operational

ACSM - Aerosol Chemical Speciation Monitor Not Operational
HTDMA - Humidified Tandem Differential Mobility Analyzer Operational

GHG - PICARRO Operational

NEPH - Nephelometer Operational

PSAP - Particle Soot Absorption Photometer Operational

BBSS - Balloon Borne Sounding System Operational

CIMEL - Cimel Sunphotometer Not Operational

PIP - Precipitation Imaging Package Operational

CCN - Cloud Condensation Nuclei Particle Counter Not installed at site yet.

MET-AIR - DataHawk Unmanned Aerial System Operational

TBS - Tethered Balloon System Operational
LPM - Laster Precipitation Monitor Operational

* Oliktok Instruments in Detail: *

INFRASTRUCTURE --- Facilities --- Operational.

2017/01/27, CM-2017-AMF3-VSN-1835: AMF3 power went down while technicians were onsite, so technicians powered up the alternate generator, and threw the breaker to switch the power supply back to AMF3. The 100 Kw backup generator was staged outside the generator "hooch," and the engine block heater was plugged in, in case of future power failure. The generator failed due to overheating, evident by the blown and leaking radiator housing. No spill occurred, and the fluid was contained immediately. All site instruments, excluding those under maintenance, were brought back online by 02:30 UTC.

INFRASTRUCTURE --- Data Systems --- Operational.

2017/01/26, CM-2017-AMF3-VSN-1831: HDD SN NA76M43D was full, so it was replaced with HDD SN NA7JSC5Y. HDD SN NA76M43D will be shipped via USPS tracking # 9114 9014 9645 0952 4695 74.

2017/01/23, CM-2017-AMF3-VSN-1828: HDD SN NA7Q2C7E was full, so it was replaced with HDD SN NA76M43D. HDD SN NA7Q2C7E will be shipped via USPS tracking # 9114 9014 9645 0952 4695 67.

2017/01/21, CM-2017-AMF3-VSN-1826: HDD SN NA77YQCG was full, so it was replaced with HDD SN NA7Q2C7E. HDD SN NA77YQCG will be shipped via USPS tracking # 9114 9014 9645 0952 4695 50.

2017/01/20, CM-2017-AMF3-VSN-1825: HDD SN NA76M78N was full, so it was replaced with HDD SN NA77YQCG. HDD SN NA76M78N will be shipped via USPS tracking # 9114 9014 9646 0952 4695 81.

INFRASTRUCTURE --- Vehicles --- Partly Operational. The Telehandler is still down.

SKYRAD --- SKYRAD general --- Operational.

SKYRAD --- IRT --- Operational.

SKYRAD --- PIR 1 shaded --- Operational.

SKYRAD --- PIR 2 shaded --- Operational.

SKYRAD --- SOLAR Tracker --- Operational.

SKYRAD --- B&W diffuse --- Operational.

SKYRAD --- NIP --- Operational.

SKYRAD --- PSPg --- Operational.

SKYRAD --- MFRSR --- Not Operational, Removed for the Winter.

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TIPTWR --- GNDRAD general --- Operational.
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TIPTWR --- MFR3m --- Not Operational, Removed for the Winter.

TIPTWR --- PIRgnd --- Operational.

TIPTWR --- IRTgnd --- Operational.

TIPTWR --- PSPgnd --- Operational.

MET --- METTOWER general --- Operational.

MET --- CMH --- Operational, but Some Incorrect Data.

2016/12/09, DQPR-5428: Jenni Kyrouac has submitted an open-ended DQR (D161118.6) documenting this on-going issue, and it has been reviewed and accepted by the PRB. The most recent DQPR status is "in progress-assignments."

2016/11/14, DQPR-5428: Joshua asked Jenni if there has been any update from the manufacturer, and states that CMH behavior has been fairly consistent since late October. Jenni responded that there has been no response from the manufacturer yet, and there are no available spares.

2016/10/21, DQPR-5428: IM Jenni Kyrouac responded that she is awaiting response from the manufacturer regarding the dew point/RH problem. As Josh notes, as of 2016/10/19, the CMH is completely stagnant. Jenni will want to check the error message on Monday, and she suspects a dew point assembly circuitry problem.

2016/10/20, DQPR-5428: Josh Remitz posted about maintenance performed after site technicians noticed CMH temperature readings were over 90c this morning. Site technicians went out to the field and physically inspected the instrument unit, finding nothing out of the ordinary. CMH relative humidity continues to read higher than 100%.

2016/09/15, DQPR-5428: Starting from 2016/07/12 the CMH data (dew point, RH and vapor pressure) dropped to unusually low values. Aspirator and mirror were cleaned and instrument power was cycled but the problem did not resolve. IM Jenni reports that no error messages are reported by the instrument and calibration info looks ok. Data have recovered after the most recent self-check. The manufacturer was contacted for suggestions. Instrument recovered, then dropped out again on 7/24. An RMA was received from the manufacturer to send the instrument for service. Spare CMH from NSA was sent to OLI and the faulty CMH was replaced with the spare from NSA. Power was restored to the replacement instrument on 08/02, 22:45 UTC. Dew point and RH were observed to be off 08/05 and 08/06. Technicians cleaned the instrument's mirror and ran through the calibration process starting on 08/08 at 22:00 UTC. Issue reoccurred on 8/6. Data drop out on 8/9 for a few hours. Problem is ongoing as on 9/1. IM Jenni will contact the manufacturer.

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MET --- Barometer --- Operational.
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MET --- TEMPERATURE / HUMIDITY —— Operational.

MET --- WIND INSTRUMENTS (SONIC) --- Operational.

MET --- PWD --- Operational.

MET --- AMC --- Operational.

ECOR --- ECOR --- Operational.

ECOR --- SEBS --- Operational.

MW RADIOMETERS --- MWR3C --- Partly Operational (Waiting on IRT Repair).

2016/10/14, DQPR-4873: The DQO/DQO-SSG/PRB has updated the DQPR status to "waiting- for spares."

2016/10/12, DQPR-4873: IM/VAP Maria Cadeddu responded that the vendor is testing the IRT sensor, but has not yet provided a timeline for return.

LIDAR --- MPL --- Operational.

LIDAR --- Doppler LIDAR --- Operational.

LIDAR --- Raman LIDAR --- Not Operational, Will be Restarted Upon Todd Houchens' Site Visit.

2017/01/20, DQPR-5906: The RL went down due to the power outage on site, and has yet to come back online. This DQPR is just for documenting the longer outage compared to many of the other instruments. IM John Goldsmith added that Todd Houchens will be on site the week of 2017/01/23 to check the laser for damage due to the cooling water freezing. He will work with John to determine if the system can be brought back into service, or if repairs are necessary. The most recent status of this DQPR is "open - requires action."

LIDAR --- CEIL --- Operational.

RADAR --- RWP --- Operational as per http://radar.arm.gov/.

RADAR --- KAZR --- Operational as per http://radar.arm.gov/. Ingest up to 2017/01/01.

2017/01/24, CM-2017-AMF3-VSN-1829: Site technicians found the radar radiate light was off while performing morning rounds. They logged onto the software and executed the PACSI command file, and the radiate light illuminated.

2017/01/23, CM-2017-AMF3-VSN-1827: The transmitter was offline. It was restarted, and the scan program was executed.

2017/01/09, DQPR-5585: Adam Theisen has listed the latest periods of missing data in a DQR. The most recent status of this DQPR is "waiting - for spares."

2016/12/02, DQPR-5585: Data is only available up to 2016/09/10.

RADAR --- KASACR --- Operational as per http://radar.arm.gov/. Ingest up to 2017/01/11.

2017/01/27, DQPR-5704: An increased noise floor occurred twice on 2017/01/03. Prior to this occurrence, the last events were on 2016/12/29, when there was an increased noise floor three times. The most recent DQPR status is "open - requires action."

2017/01/23, DQPR-5947: When switching to ppivh mode, one of the boards that controls transmit switching is getting confused, and the mode defaults to single pol mode. The radar is transmitting on H, but not V. This also causes the drop in rhohy, as it's correlating the H return with what is mostly a noise field (plus the cross polar signal). Unfortunately, these files won't be fixable, and so neither should be used. At the very least, their polarimetric variables should not be used. This is a sporadic problem, and does appear to be fairly infrequent. These files will need to be DQR'd. The most recent DQPR status is "open - requires action."

2017/01/09, DQPR-5848: Just to document, this apparent ingest issue is occurring in the latest data up through 2016/12/22. The most recent DQPR status is "open-requires action."

2016/12/15, DQPR-5848: Starting on 2016/09/27 at 19:30 UTC, there looks to be an issue with how the ingest is setting the transition flag, and getting the sweeps for the HSRHI data. The number of sweeps in the HSRHI files start to shift between 1-3, when the shifting should not start until 4. Some examples of the azimuth and transition flags are posted below. The most recent status of this DQPR is "open — requires action."

2016/10/12, DQPR-5704: The data looks saturated at times. It looks like we are still getting some returns, so it does not seem that the transmitter is going out. This is occurring in both RHI (Range Height Indicator) and PPI (Plan Position Indicator) plots at random times. This was brought up during the data review, but it looks to be an ongoing problem. See DQPR for attached plots. IM Joseph Hardin replied that this might just be an issue of terminology, but that he does not see any saturation, nor missing data. Adam Theisen posted previous scan plots for reference. He noted that it is probably a terminology issue, but if you look at the previous RHI scan, there is a large difference in the background reflectivity, as well as a jump in the Zdr (differential reflectivity) values. Joseph replied that we tend to refer to these particular plots as having an increased noise floor. There is something more subtle going on here that we are attempting to track down. It does seem to be very infrequent (once a day or less per mode).

RADAR --- KaWSACR --- Operational as per http://radar.arm.gov/. Ingest up to 2017/01/11.

2017/01/27, CM-2017-AMF3-VSN-1836: The SACR dehydrator was not building any pressure. Technicians found the leak which was found to be from the air line from the compressor to the dehydrating coils. Constant chaffing of the

hose on the chassis caused the problem. Technicians put dehydrating coils on stand offs to raise them up, and the hose was insulated with a collar. The system is now operational.

2017/01/11, DQPR-5705: PPI missing data was found on 2016/12/29, and HSRHI missing data was found on 2016/12/11. The most recent DQPR status is "open- requires action."

2016/12/09, DQPR-5705: Adam Theisen added that the latest data from the DMF is from 09/19.

2016/10/12, DQPR-5705: WSACR is sometimes showing some degraded/missing data. In the PPI (Plan Position Indicator) plots, there are missing data between 60-90 degrees. In the RHI (Range Height Indicator) plots, there are missing data throughout the scans. In the RHI, the background Zdr signal drops out, and the values in the echo region are high compared to bracketing scans.

IMG --- TSI --- Not Operational, Removed for the Winter.

IMG --- MASC --- Operational, Data Ingest Up to 2017/01/11.

2017/01/24, DQPR-5954: The MASC image collection within the MASC Mac mini computer failed from 2017/01/11 at 22:37 UTC to 2017/01/24 at 22:00 UTC. A camera freeze-up was expected, and site ops checked the MASC and its IR sensors. The trigger function tested ok, so the MASC software was restarted, and the manual trigger function executed. Collection was resumed. The most recent DQPR status is "open - requires action."

2017/01/24, CM-2017-AMF3-VSN-1830: The MASC was not storing images, and a camera freeze-up was expected. David Oaks checked the MASC and the IR sensors, and all looked good. The trigger function also tested ok. Subsequently, the MASC software was restarted, and the manual trigger function executed. Now, images are being stored.

AOS --- General --- Partly Operational (Data Dropouts).

2017/01/06, DQPR-5858: IM Cynthia Salwen has added the following: Brent has not found anything in the logs yet. He spoke with an instrument mentor who developed serial software; this mentor said that moving to a VM caused problems with the serial, and consequently, the mentor had to use a different serial library. Since the software is developed with labview, the options are different. Cynthia will try other tests, and Brent will talk to his team about this. The most recent DQPR status is "open - requires action."

2016/12/21, DQPR-5858: This DQPR has been linked to DQPR 5815, and the most recent status of this DQPR is "open - requires action."

2016/12/20, DQPR-5858: OLI and SGP both have virtual machines for the AOS computers, and both are showing data dropouts on multiple instruments at the same time. These dropouts can be as short as a couple of seconds, or up to 30 seconds or more. In OLI there are missing data lines at the same time in the files for the WXT520, which is on Unit 1, and the CPC3772, CPC3776, and Dryneph, which are on Unit 2. There are no dropouts on the Wet Neph. SGP shows dropouts in the data files of the WXT520, which is on Unit 1 and the TAP, CPC3772, and the Dry Neph at the same time. At both sites, the dropouts seems to have started at the beginning of the deployments. There are no other error indications that the data is not being received from the instruments. Brent Kolasinski is looking into the VMWare logs and expects to consult with VMware support.

AOS --- aosmet --- Operational.

AOS --- UHSAS --- Operational.

2017/01/27, DQPR-5942: Joshua suspects that something changed as of 2017/01/25, since the characteristically "low" signal experienced a step-like change at that time (see image attached to DQPR). David Oaks commented that it looks like the change correlates with the time he restarted the PSAP (18:55 UTC) after replacing the failed CPC pump.

2017/01/20, DQPR-5942: Beginning on 2017/01/17 at around 21:00 UTC, and ending on 2017/01/18 at 18:30 UTC, there seems to be a repeated periodicity in the UHSAS size distribution and associated total particle concentration. See the attached image on the DQPR page. IM Janek added that this periodicity looks very much like the nephelometer signal. He asked that Joshua check if these correlate with the nephelometer pressure/impactor setting? He is at ASI and his connection to the outside world is not very good. His guess is that the instrument was

accidentally connected on the impactor branch of the inlet system. Joshua responded that the UHSAS signal looked anti-correlated with the dry nephelometer (impactor) signal. Namely, a high UHSAS signal was associated with a 1-um impactor setting, and a low UHSAS signal associated with a 10-um impactor setting. Joshua is wondering if this might have been associated with the PSAP pump failure covered in DQPR 5937. That reportedly began 20:00 UTC on 2017/01/17. IM Stephen Springston added that something is going on, and he is not sure what that is. He agrees with Janek that it looks like the UHSAS MIGHT be connected on the impactor branch of the inlet system. He asked that Josh check with Scott Smith. Janek replied that when the technicians removed the PSAP, they accidentally plumbed things incorrectly. Then at some point, they realized their mistake, and corrected it, for the problem is gone now. Janek has an assignment to write DQR D170123.2. Fred Helsel added that his suspects that the instrument still has a problem. If the instrument was accidentally connected on the impactor branch of the inlet system, the operators would have documented this fixing in a CM report. The most recent DQPR status is "in progress - assignments."

AOS --- CPC --- Operational.

2017/01/27, DQPR-5941: Robert Bullard has an assignment to write a DQR (D170127.4), and the most recent DQPR status is "in progress - assignments."

2017/01/26, DQPR-5941: Technicians replaced and restarted the CPC pump at 18:40 UTC on 2017/01/25. The 2 CPCs were restarted at 22:30 UTC on 2017/01/25.

2017/01/25, CM-2017-AMF3-VSN-1832/1833: The pump connected to the CPCs (CPC 3776 and CPC 3772) failed due to pressure build up from the outside exhaust tube plugged with ice. The instruments were shut down until a replacement pump arrived. Technicians replaced the pump once it arrived onsite, and proceeded to restart the CPCs after the pump was replaced.

2017/01/20, DQPR-5941: Beginning on 2017/01/11 at 22:39 UTC, all CPCU and CPCF data are missing. The outage begins at the same time for both. Joshua King does not believe that this gap is associated with any other AOS-related DQPRs open at the moment.

AOS --- CAPS-PMEX --- Partly Operational.

2017/01/20, DQPR-5816: This instrument continues to have problems. As a result, IM Arthur is asking that the OLI-CAPS be sent to BNL for servicing, as the problem cannot be diagnosed remotely. Scott Smith will send the shipping container for the instrument to OLI. Joshua King suggested that this DQPR be escalated to PRB attention, given the ongoing issues. Arthur Sedlacek has started the logistics of sending the unit to BNL. The most recent DQPR status is "open - escalated to PRB attention."

2017/01/04, DQPR-5816: This DQPR has been linked to DQPR 5895. Joshua King added that he opened 5895 to separately resolve the raw data/collection/ingest issues described for the CAPS and CO beginning 2016/12/28. This DQPR can continue to serve as a resolution point for the potential NO2 contamination issues affecting the CAPS. The most recent DQPR status is "open - requires action."

2016/12/15, DQPR-5816: Joshua asked Art what kind of timeline he needs for further investigation. Art responded that we are currently collecting data on particle-free ambient air via a HEPA filter. We are doing so to confirm that the molecular interference is coming from NO2, to identify the wind directions which bring in the NO2, and to collect enough data in the current configuration to figure out if one channel could serve as the molecular interference monitoring channel. This monitoring channel is likely to be the blue channel, which will allow us to correct the green channel. Upon Art's return to BNL next week, he will look at the data to see if the statistics will allow for this. 2016/12/02, DQPR-5816: Arthur added that only the red channel will be free of NO2 signal contamination. Therefore, the red channel data are fine. This DQPR has been linked to DQPR 5806 and DQPR 5807, and the most recent status of this DQPR is "open - requires action."

2016/12/01, DQPR-5816: Since the CAPS takes a measurement of the molecular extinction every 20 minutes, and subtracts this quantity from the total extinction measured during normal operation, the only way to consistently generate a negative extinction is to have a baseline (acquired on particle-free air) that is larger than the total extinction. The only way this could happen is if a time-varying molecular species is present. Further investigation has suggested that locally sourced anthropogenic emissions of NO2 is the likely origin of these episodic periods. There

are 3 pieces of evidence that NO2 is the culprit: firstly, optical extinction under particle free conditions (which are achieved with a HEPA filter) reveals that these episodes characterized by negative extinction also exhibit a wavelength dependence in light absorption that parallels the known absorption spectrum of NO2 (see 2nd attached file on DQPR page); secondly, negative signals are tightly correlated with CO, a known tracer from combustion activities; lastly, the local prevailing wind direction is from the north, where there are sources of diesel emissions. Taken together, this is strong evidence for the presence of NO2 emissions impacting the OLI AOS. Using a calibration for the green, it is estimated that the NO2 loading is over 1.2 ppb. The CAPS simply measures optical extinction, irrespective of whether the extinction is molecular or particulate in origin. The CAPS takes a particle-free background reading every 20 minutes in an effort to account for variations in molecular extinction caused by changes in the molecular composition of air masses. However, the large absorption cross-section of the NO2, and shifts in particle loadings thwart the background correction scheme employed by the CAPS instrument. Since we don't have a NO2 measurement at the OLI site to determine NO2 to be the culprit, IM Arthur Sedlacek has asked the AOS technicians to install a HEPA filter in the CAPS sampling line to confirm that the behavior described above is due to molecular species, and not particles. Arthur will also contact the manufacturer about the idea of converting the blue channel to a particle-free green channel. In this way, we will have a constant measure of NO2, thereby enabling the green aerosol channel to be corrected for these episodes. In the long term, we may want to terminate aerosol extinction measurements via the CAPS at Oliktok, or, live with the issue, and simply flag data as bad (unusable) when the wind direction is from the north, where the desalination plant is located. Other long-term options include adding a fourth channel to the CAPS that measures NO2 full-time, using an NO2 scrubber on the front end of the CAPS (this is a consumable, and particle loss issues would have to be determined), or procuring a separate way of locally measuring NO2. This observation does raise the question as to what is precisely present in these plumes. It is possible that other molecular species (e.g., hydrocarbons) could be present locally, and have the potential of impacting other instruments. Several informative graphs have been posted to the DQPR.

AOS --- ACSM-- Not Operational (Waiting on a Valve)

2017/01/04, DQPR-5887: The filter switching valve has stopped working. The problem was discovered on December 21st, but the exact start date of the problem will be determined upon examination of the data. A new valve will be shipped to OLI this week, and data acquisition has been stopped until the new valve is installed. The most recent status of this DQPR is "waiting - for spares."

AOS --- GHG-Picarro --- Not Operational (offline since data outage, awaiting replacement parts).

2017/01/20, DQPR-5908: Ken shipped replacement parts that arrive on site from 2017/02/01 - 2017/02/04. The system is not collecting data due to the analyzer and/or pump issue. The exact source of the problems are currently being worked out, and he will provide an update as things go on. The IM has updated the DQPR status to "waiting for spares."

2017/01/10, DQPR-5908: The GHG went down during the site-wide power outage at 14:00 UTC on 2017/01/05. Unlike other instrument systems, the system has not been brought back online as of today. IM Ken Reichl added that the Picarro pump has not been powered on as of 19:38 GMT on 2017/01/10. Ken Burk from the DMF responded that the data seems to be flowing now. One exception is that for the last 3 days the file 'CFADS2364_NA_NA_DataLog_User.dat' has made it's way to the DMF @ approximately 12:15. The ingest does not seem to like that file, so IM Ken authorized turning off the collection of files with NA_NA within the file name. He also disabled the creation of these files. The reason these files are being created is due to the Picarro pump not functioning, and therefore, the analyzer is not producing data. As long as the Picarro is not functioning, oliaosghgM1 raw data is not being produced. IM Ken is looking into a solution, such as perhaps sending a replacement pump box for the GHG. The most recent DQPR status is "open - requires action."

AOS --- HTDMA --- Operational.

2017/01/27, DQPR-5805: Joshua King asked David Oaks if we should be collecting raw data again, since the latest is from 2017/01/11. The most recent DQPR status is "in progress - assignments."

2017/01/26, CM—2017-AMF3-VSN-1834: Technicians replaced the failed MCPC unit, and now the HTDMA instrument is operational.

2017/01/12, DQPR-5805: Janek said that restarting the HTDMA went fine, and overall, the instrument is ok. However, the MCPC condenser cooler is not working. Tests show no voltage on the cooler pins. The manufacturer has been contacted, and Janek has a spare MCPC at hand that may be sent to the site if needed. Janek submitted DQR D161208.2, which was reviewed and accepted by the PRB.

2017/01/06, DQPR-5805: Ingests are still off. After several power outages at AMF3, the instrument is currently offline. As of the last check on 2016/12/22, the HTDMA was producing good quality data with some minor flow issues. These will be checked on once the power is restored. AMF3 is currently experiencing Phase 3 blizzard conditions, and the emergency heating system reportedly kicked in. Operators will have to check the system to see if there is any freezing damage.

2016/12/16, DQPR-5805: Janek replied to Joshua's request for turning on ingest/collection, asking for DMF to wait until the valve is fixed. Operators discovered something with the valve that could be the cause for the flows we are seeing, and it will be tested today.

2016/12/15, DQPR-5805: Joshua King asked the DMF team if collection/ingests could be turned back on given Janek's comments from yesterday.

2016/12/14, DQPR-5805: The MCPC was successfully installed, and is showing counts. The scanning works nicely, but the humidifier sheath RH is low. This is probably due to a stuck internal valve, which we will test.

2016/12/06, DQPR-5805: After numerous tests on the MCPC have failed to pinpoint the cause for zero counts, a spare MCPC is being shipped in, and the old one returned for maintenance. Janek Uin has an assignment to write an open-ended DQR D161208.2, and the most recent status of this DQPR is "waiting - for spares."

2016/11/29, DQPR-5805: Beginning at around 20:00 UTC on 2016/11/21, HTDMA size distributions and aerosol concentrations have flatlined at 0/cm^3 (see attached graph). IM Janek Uin responded that the MCPC was flooded, and the temperature in the AOS dropped to the levels where the HTDMA RH is too low. The MCPC was drained, and we are waiting to see if that worked. We are looking into insulating the HTDMA, and raising the AOS temperature. The most recent status of this DQPR is "open - requires action."

AOS --- UHSAS --- Operational

AOS --- NEPH --- Operational.

AOS --- IMPACTOR --- Operational.

AOS --- OZONE --- Operational.

AOS --- TRACEGAS --- Operational.

AOS --- PSAP --- Operational.

2017/01/27, DQPR-5937: Technicians replaced the failed pump, and restarted the PSAP at 18:55 UTC. Steven Springston has an assignment to write DQR D170127.7 about the outage period. There will not be an official end date before ingests are operational once again, but it looks like raw data returned on 2017/01/25. The most recent DQPR status is "in progress - assignments."

2017/01/18, DQPR-5937: Technicians have shut down the PSAP due to a possible failure to the pump feeding the instrument. Operators are waiting on the replacement pump. The most recent DQPR status is "waiting for spares."

Other --- AERI --- Operational (Watching Out for Future Data Outages).

2017/01/27, DQPR-5630: Adam listed another period of downtime: 2017/01/05 @ 14:38:13 to 2017/01/07 @ 16:47:19. Since these periods of data NA are still occurring, Adam recommends that this DQPR be left open, and that an open-ended DQR should be created with the date noted above to alert the end users that this a known issue. Denny agreed, and noted that the last downtime was due to the power outage, and he thinks that there was a DQR for that outage already. There are 2 different DQRs for the downtime on 2016/11/26 to 2016/11/28. D161128.2 (regarding inability to communicate to the interferometer) was submitted for Denny, and Adam Theisen submitted D161129.1 (regarding instruments down due to the power outage). Adam deleted the DQR he submitted since it was a duplicate, and he has now assigned 2 DQRs to Denny (D170127.5 and D170127.6)—-one for the

period of missing data in December that is not documented, and one for an open-ended DQR for future outages. The most recent DQPR status is "in progress- assignments."

2017/01/24, DQPR-5630: Denny Hackel has determined not to make the code change, as he has not seen the problem since it occurred that one time. He thinks adding the loop could lead to adverse effects. The downtime during the last 3 months has been due to failure of the software to communicate with the interferometer. These issues looked particularly bad in December, but after the extended downtime earlier this month, things are working much better. There was extended downtime (longer than a day) with failure to communicate to the interferometer from 2016/11/26 @ 22:06 to 2016/11/28 @ 0Z and 2016/12/15 @ 6:53 UTC to 2016/12/17 @ 18:35 UTC, a period for which a DQR should be submitted.

2016/11/23, DQPR-5630: Denny added that the short periods of data NA, occurring 1-4 times a day, happen on all AERIs when they lose connection to the interferometer. The vendor, ABB, has been trying to fix this issue for a while. He noticed on 2016/11/02 that data collection stalled around 14 UTC for the day. It looks like a call to acquire data from the interferometer didn't return until the 0z restart. The error is similar to the previous stalling of killing executables, however, the error appears in a different section of code. He plans to add a "while" or "for" loop that will run for up to 20 minutes, and fail if a call doesn't return. This way, the software will restart upon failure. The most recent status of this DQPR is "open- requires action."

2016/10/21, DQPR-5630: Adam Theisen reported that these short periods of data NA are still occurring anywhere from 1-4 times per day, and data are NA for 20-40% for each hour this occurs. He attached a link to DQ metrics: http://bit.ly/2edFbQB.

2016/10/13, DQPR-5630: The AERI-110 at Barrow with a VM was also having a similar problem, so Denny updated the code on that VM as well.

2016/10/12, DQPR-5630: Denny added an os.P_NOWAIT option to the code, checking that the process exited. We will have to monitor this for 3-4 weeks to see if this corrects the timeouts or not.

2016/10/11, DQPR-5630: IM Denny Hackel says that the software is stalling because a process' exit code is not being returned after it is killed. He has not seen this issue before, so it might be due to running the software on the VM, or a new intermittent feature of Windows. On September 21st, it took about 6 hours for the exit code to be returned (see DQPR for the code log). When the interferometer is unresponsive, we have had to kill the control and calibration software, and restart. After 4 tries without success, we reboot the interferometer internal and AERI computers. We will look into alternative calls to kill processes, and/or figure out why the exit code isn't being returned. The process isn't found in tasklist, but can be seen under cygwin running "ps -a." You cannot kill the process from the cygwin window either.

2016/09/30, DQPR-5630: After coming back online the AERI had numerous periods of data NA. All periods have been less than 24 hours so far. Adam asks the instrument mentors if the problem is related to the switch to a VM (virtual machine)?

Other --- BBSS --- Operational.

Other --- CIMEL --- Not Operational.

Other --- PIP --- Operational, Working on Beginning Data Ingest to DMF Archives.

Other --- CCN --- Not at the site yet.

2017/01/27, DQPR-5447: Stephen noted on this week's DQPR coordination call that the instrument was being sent back to the vendor for additional troubleshooting. The most recent DQPR status is "waiting — for spares."

2017/01/06, DQPR-5447: The instrument started showing that wide distribution again. The OPC was switched out, and the distribution looks normal again. Concentrations between the column are currently different at the same supersaturations. Most likely, the calibration changed with the OPC switch. The instrument will be re-calibrated as soon as possible.

2016/12/20, DQPR-5447: Janek received the power supply, and he is letting the instrument run to confirm the previous issue. He is currently not seeing the wide size distribution at high supersaturations, and has a spare OPC at hand to install if needed.

2016/12/06, DQPR-5447: Janek added that we are awaiting a spare CCN power supply to turn the instrument on as to provide data to DMT.

2016/11/17, DQPR-5447: Nothing has changed, and Janek is discussing with others on how to approach DMT.

2016/10/24, DQPR-5447: Email distribution flag changed - distribution will exclude site operations. Janek received no reply from DMT, but will try again. The most recent DQPR status is "waiting- for spares." The DQPR requires an end date to close it.

2016/10/13, DQPR-5447: An issue with one of the OPCs (Optical Particle Counter) was discovered. The OPC's particle size distribution is very wide, and does not match the other OPC under the same conditions. Contacting DMT.

2016/09/12, DQPR-5447: Janek Uin reports that the CCN was calibrated and proper operation verified before shipping the instrument to the OLI site (Linked DQPR-5290). A difference in concentrations between the columns at 1% supersaturation was discovered after calibration.

Other --- DataHawk Unmanned Aerial System --- Operational, not a full time instrument.

Other --- TBS --- Operational. Sensor will not be running full time.

Other --- LPM --- Operational, Working on Beginning Data Ingest to DMF Archives.

Barrow

INFORMAL NSA INSTRUMENT STATUS REPORT FOR January 20, 2017 - January 27, 2017

BRIEF STATUS OF INSTRUMENTS IN BARROW (C1) AS OF 2017/01/27:

Facilities Operational

Data Systems Operational

Vehicles Partly Operational

SKYRAD - SKY Radiometer on Stand for Downwelling Operational

MFRSR - Multifilter Rotating Shadowband Radiometer Not Operational

NIMFR - Normal Incidence Multifilter Radiometer Not Operational

GNDRAD - Ground Radiometer on Stand for Upwelling Partly Operational

MFR10m - Multifilter Radiometer at 10m height Not Operational

METTOWER - Surface Meteorological Instrument on tower Operational

AMC - Soil, up/downwelling radiation measurements Operational

ECOR-twr - Eddy Correlation Flux System Operational

ECOR-PtBRW - Eddy Correlation Flux System Not Operational

MWR - Microwave Radiometer Operational

MWRP - Microwave Radiometer Profiler Operational

MWRHF - Microwave Radiometer High Frequency Operational

GVR - G-band Vapor Radiometer Operational
HSRL - High Spectral Resolution Lidar Operational

MPL - Micropulse Lidar Operational
CEIL - Vaisala Ceilometer Operational
DL - Doppler LIDAR Operational

RWP - Radar Wind Profiler Operational as per http://radar.arm.gov

KAZR - Ka ARM Zenith Radar Operational

KaWSACR - Ka-Band Scanning ARM Cloud Radar Not Operational as per http://radar.arm.gov

XSAPR - X-Band Scanning ARM Precipitation Radar Not Operational as per http://radar.arm.gov

AOS - Aerosol Observing System Not Operational

CLAP - Continuous Light Absorption Photometer Not Operational

CPC - Condensation Particle Counter Not Operational

NEPH - Nephelometer Not Operational

TOWERCAM - 40m tower camera Operational

TSI - Total Sky Imager Not Operational

AERI - Atmospheric Emitted Radiance Interferometer Operational

BBSS (Autosonde) - Balloon Borne Sounding System Not Operational

CIMEL - Cimel Sunphotometer Not Operational
PIP - Precipitation Imaging Package Operational

TPS - Total Precipitation Sensor Not Operational

CAM Operational

* Barrow Instruments in Detail: *

INFRASTRUCTURE --- Facilities --- Operational.

INFRASTRUCTURE --- Data Systems --- Operational.

2017/01/25, CM-2017-NSA-VSN-4221: The TPS wireless was received and connected to the network. The wireless was powered up inside the E5 for testing prior to TPS installation.

2017/01/23, CM-2017-NSA-VSN-4220: A data storage disk was removed, replaced, and mailed out.

INFRASTRUCTURE --- Vehicles --- Partly Operational. Telehandler is down (hose rupture), and in the shop.

SKYRAD --- SKYRAD General --- Operational.

SKYRAD --- IRT --- Operational.

SKYRAD --- PIR 1 Shaded --- Operational.

SKYRAD --- PIR 2 Shaded --- Operational.

SKYRAD --- SOLAR Tracker --- Operational.

SKYRAD --- B&W diffuse --- Operational.

SKYRAD --- NIP --- Operational.

SKYRAD --- PSPg --- Operational.

SKYRAD --- MFRSR --- Not Operational, Removed for the Winter.

SKYRAD --- NIMFR --- Not Operational, Removed for the Winter.

TIPTWR --- GNDRAD general --- Partly Operational (missing and incorrect data)

2017/01/25, DQPR-5860: Up long hemispheric has gone missing again as of approximately 20:00 UTC on 2017/01/22, and has not yet come back. The most recent DQPR status is "open - requires action."

2017/01/20, DQPR-5860: Data comes back on 2017/01/20 at 08:09 UTC.

2017/01/09, DQPR-5860: Data looks to come back on 2016/12/30 at 23:26, and then goes missing again through the current date. The ranges of missing data so far include: 2016/11/10 @ 14:00 to 2016/12/30 @ 23:26, 2017/01/04 @ 02:57 to 2017/01/05 @ 17:49, 2017/01/06 @ 11:19 to the present.

2016/12/21, DQPR-5860: There has been some missing data since 14:00 UTC on 2016/11/10: up long hemispheric, up long hemispheric max, and min. Missing data was proceeded by incorrect data that exceeded their max limits.

TIPTWR --- MFR10m --- Not Operational, Removed for the Winter.

TIPTWR --- PIRgnd --- Operational.

TIPTWR --- IRTgnd --- Operational.

TIPTWR --- PSPgnd --- Operational.

MET --- METTOWER general --- Operational.

MET --- CMH --- Operational.

MET --- Barometer --- Operational.

MET --- TEMPERATURE / HUMIDITY --- Operational.

MET --- WIND INSTRUMENTS (SONIC) --- Operational.

MET --- PWD --- Operational.

MET --- AMC --- Operational.

2017/01/27, DQPR-5835: Data is getting to the DMF now—-it has been processed, and the ingest is enabled. Ken Reichl has been assigned DQR D170127.9, and the most recent DQPR status is "in progress - assignments."

2017/01/13, DQPR-5835: If weather permits, operators will connect other sensors. The most recent DQPR status is "open — requires action."

2017/01/09, DQPR-5835: Walter has not yet had a chance to spend time connecting soil sensors (to see which one causes the logger to drop power) due to weather conditions and other instrument issues.

2016/12/15, DQPR-5835: Foxes have again eaten the set of sensor wires that were repaired in early November. Walter asked if the mentor can identify the set of wires to disconnect from the logger to prevent shorting and to collect from other sensors.

2016/12/14, DQPR-5835: On 2016/11/14, old data from Aug-Oct were re-sent. That data has been cleaned up, and bundled back on.

2016/12/09, DQPR-5835: All data is missing since 2016/11/22 at 18:00 UTC. DSView shows that no data has been collected from the instrument since this day, and the bundle is flagged as "getting old data." The most recent status of this DQPR is "open - requires action."

2016/11/03, DQPR-5694: This DQPR has been linked to DQPR 5756, and DQR D161011.3 has been submitted and reviewed by PRB. The most recent status of this DQPR is "in progress - assignments."

2016/10/11, DQPR-5694: Joshua responds to IM Ken Reichl that after conferring with others at the Data Quality Office, the best action is to create another DQR about this behavior, like the one that exists for OLI. Joshua has

assigned an open-ended, "transparent" DQR to Ken. He then asks what the relevant time period was for this issue within the NSA C1 AMC data record. The status of this DQPR is "in progress-assignments."

2016/10/10, DQPR-5694: Joshua King adds that vmc from sensor 4 was missing from 14:30 UTC 2016/07/12- 15:30 UTC 2016/09/25. Since returning 2016/09/25, vmc has been decreasing to below 0.3. He is asking mentors if they have thoughts on what is causing this behavior. An attached image can be found on the DQPR page. IM Ken Reichl responds that this is an issue outlined in DQPR-4793 for the analogous site, OLI. The instrument reports soil data as 9999999, or a non-numerical character (for data SGP) for soil systems. The AMC systems may report missing data during warm seasons for instruments that are not sufficiently calibrated. The OLI datastream has an open-ended DQR D151023.3. Ken asks if he should make one for the NSA data as well, and is the DQR system the best way to characterize this issue?

2016/10/09, DQPR-5694: Vwc (volumetric water content) 4 is missing for the entire period starting 16/07/12 to 16/09/25.

ECOR --- ECOR-twr --- Operational.

ECOR --- ECOR-Pt. Barrow --- Not Operational, End of Season.

2016/12/12, DQPR-4322: Power supply problems prevented us from collecting any data this past autumn, and the ECOR/SEBS system was removed for winter on Dec 7th to prevent further bear damage. The most recent status of this DQPR is "in progress - assignments."

2016/12/09, DQPR-4322: Adam Theisen added that the ingest appears to still be off.

2016/11/21, DQPR-4322: Despite being able to communicate with the Point sometimes, no data shows up in the Archive. David will ask if the ingest is running.

2016/10/07, DQPR-4322: IM David Cook says that the ECOR/SEBS system was reinstalled and running at approximately 2400 CST on 9/28/2016. However, reliable radio communication has not been established with the instrument system, and manual data collection may be needed as the radio communication problem is actively being investigated.

2016/09/23, DQPR-4322: The SEBS re-installation is scheduled for September 26-30, 2016.

MW RADIOMETERS --- MWR --- Operational (Data Spikes).

2017/01/25, DQPR-5946: Walter checked the storage for a spare, and found nothing. After checking his emails, he realized the spare was shipped to PNNL. There is no spare at NSA. Maria Caddedu has submitted DQR D170127.1, and it is pending PRB review. the most recent DQPR status is "in progress - assignments."

2017/01/22, DQPR-5946: There is a large spike in the data from 2017/01/05 at 16:00 UTC to 2017/01/11 at 21:00 UTC. Then, the PWV data seems unreliable during the period of 2017/01/05 to 2017/01/11. The radiometer set temperature suddenly dropped from 306 K to 280 K around 2017/01/05. This caused a lot of instability in the radiometer. The data should be listed as red in the DQR, and the radiometer should probably be removed and sent to Radiometrics. Maria Cadeddu will check with SGP for a spare and request an RMA from Radiometrics. Walter will check for a spare MWR in Long Term Storage.

MW RADIOMETERS --- MWRP --- Operational (Data Spikes, Missing Data).

2017/01/25, DQPR-5297: The instrument was reinstalled on 2017/01/11. The data has been processed, and the ingest enabled. There is a fair amount of missing data (-9999) showing up along with intermittent spikes in many variables, including the brightness temps. IRT data are flatlined around 220k. Some of this may be normal, as it has been a while since Adam has looked at these data. Walter added that it is currently -33F on the ground, so surely the sky temperatures are much colder. Maria has updated the mp.cfg file on 2017/01/21, and proposes that we plan a LN2 calibration. The most recent DQPR status is "waiting - for spares."

MW RADIOMETERS --- MWRHF --- Operational (External Noise Interference).

2016/09/30, DQPR-4165: The 150 GHz channel was showing high noise levels probably because of an external source of interference. Adam inquires if there is a path forward to solve the interference issues? The current DQPR

status is "in progress- assignments", and it is open-ended. DQRs D140610.1 and D160426.3 have been reviewed and accepted by the PRB.

MW RADIOMETERS --- GVR --- Operational.

LIDAR --- HSRL --- Operational.

LIDAR --- MPL --- Operational (Missing Data).

2017/01/09, DQPR-5899: Paytsar still cannot access the MPL computer to check on the missing data, and has an assignment to write a DQR (D170109.2). The most recent DQPR status is "in progress - assignments."

2017/01/05, DQPR-5899: Data from 2016/12/28 at 18:48 UTC to 2017/01/02 at 18:54 UTC is not available. IM Paytsar Muradyan asked that site ops provide updates on the missing data. Paytsar is not able to connect to the MPL computer to check on status.

LIDAR --- CEIL --- Operational.

LIDAR --- Doppler LIDAR --- Operational.

RADAR --- RWP --- Operational.

RADAR --- KAZR --- Operational.

RADAR --- KaWSACR --- Not Operational per http://radar.arm.gov.

2016/10/23, CM-2016-NSA-VSN-4158: The Ka Band chiller overflowed, and we suspect it is because of a faulty pump. The unit was shipped to SGP until repair paperwork can be generated. The chiller (S/N 10080330) was removed and drained, and we are awaiting a spare, or for this unit to be rebuilt.

2016/03/12, DQPR-4041: After much coordination with the pedestal manufacturer and while working with the instrument mentors, the azimuth DSA was re-programmed. Once a reprogrammed Azimuth DSA was installed and verified the Elevation DSA was also found to be faulty. It was replaced with another unit and the system now accepts azimuth and elevation commands. The most recent DQPR status is "waiting- for spares."

RADAR --- XSAPR --- Not Operational as per http://radar.arm.gov.

2016/08/04, DQPR-4841: The elevation servo amplifier failed, the radar can not scan in elevation. The radar will be upgraded by the end of this year, and will be turned off until then. A DQR was submitted and reviewed by PRB. The DQPR status is "in progress" due to it being open-ended. Adam Theisen's DQR D160719.1 has been reviewed and accepted by the PRB.

AOS --- General --- Not Operational, No Ingest.

2016/10/27, DQPR-5524: Joshua King asks if there is any update on the raw data file update work that Annette outlines in her 2016/09/23 comment? The most recent status of this DQPR is "in progress - assignments."

2016/09/23, DQPR-5524: Annette Koontz says that NOAA will provide a csv text file with measurements for the instruments that are running. We will need to generate a new ingest for this new raw data format, and work is expected to start sometime in October 2016. The goal is to make the nsaaos*X1.a1 files look identical to the existing nsaaos*.a1 for the instruments contained in this new raw file.

2016/09/22, DQPR-5524: Joshua King requests that this DQPR be escalated to PRB attention.

2016/08/29, DQPR-5524: Beginning at 12:00 UTC on 08/18/2016, data for all ingested NSA X1 AOS data products are missing. It looks like a collection issue. On switching to new data acquisition system, some bugs were found especially with the new instruments that came online. Also, there was a power outage on site on 8/21 and the instruments do not seem to be back up. There are some issues with data acquisition timing, as some instruments are wind-sectored and turn off/on with WD and WS. Chemical filter measurement is the main concern as data collection works differently for this instrument. According to IM Anne, Aethelometer compact disk card (8 GB) fills up with 1 second data frequency. The card filled up, causing the instrument to stop collecting data, and thus, other problems ensued. If there are changes in the raw data, BCR will be needed to do the ingest updates. According to

Joshua King, this seems to be affecting the flow of data from all NSA X1 AOS instrument systems and ingest issue is related to a lack of nsaaosX1.00 raw data files since 08/18. This DQR is linked to DQPR 5561 and 5562.

AOS --- AETH --- Not Operational.

AOS --- CLAP --- Not Operational.

AOS --- CPC --- Not Operational.

AOS --- NEPH --- Not Operational.

IMG --- TOWERCAM --- Operational.

IMG --- TSI --- Not Operational, Removed for the Winter.

Other --- AERI --- Operational.

Other --- BBSS --- Not Operational (Autosonde), Will Be Repaired. As of 2017/01/24, Launches Will Be Manual!

2017/01/24, DQPR-5953: The Autosonde pneumatic system failures have caused missing launches from 2017/01/15 to 2017/01/17, on 2017/01/19, and will cause missing data from 2017/01/23 until the instrument is repaired. Beginning on 2017/01/15, the pneumatic cylinder(s) on the cover lid failed, and inflated balloons were not able to be launched. On 2017/01/21, the main air compressor failed. The system ran on the backup compressor, but the pneumatic ram(s) began failing again—it was not possible to close them without force. The vendor has been slow to respond to requests for replacement part quotes. On 2017/01/24, Site ops shut down the Autosonde at C1, and will be doing manual launches from the backup system (S01). A Vaisala Autosonde technician is helping site ops and IM Donna Holdridge find a path forward for repair. They are currently awaiting a quote before ordering repair parts. The most recent DQPR status is "open - requires action."

Other --- CIMEL --- Not Operational, Removed for the Winter.

Other --- PIP --- Operational.

Other --- TPS --- Not Operational. Will Be Installed Soon.

Other --- CAM --- Operational.

5 North Slope Facilities

AMF3

Current and Upcoming Site Visits

Todd Houchens/SNL01/25-28/2017Raman Lidar inspection/radar workKen Reichl, Andrew Moyes/LBNL01/31-02/04/2017AOSGHG maintenanceFred Helsel/SNL02/28-03/08/2017Ice Nucleating Particle Sources IOPJessie Creamean/CIRES02/28-03/13/2017Ice Nucleating Particle Sources IOP

Current and Upcoming IOPs

Black Carbon on the North Slope (Baylor)

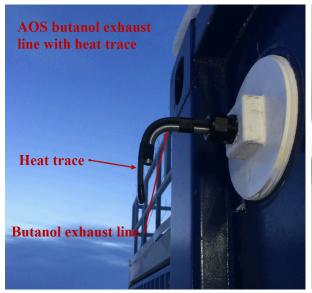
Ice Nucleating Particle Sources (Jessie Creamean on-site) KERRI PRATT, RACHEL KIRPES, NICHOLAS SPADA and GOURIHAR KULKARNI IOP starting 2/28/2017

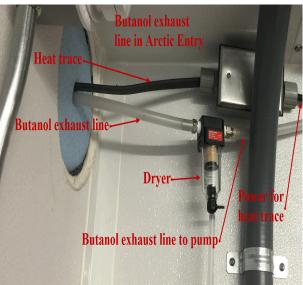
Site News/Issues

The AOS butanol exhaust line freezing shut. The AOS instruments using butanol had to be shut down due to butanol vapors being exhausted into the AOS and Artic Entry. It was found that the exhaust line was freezing shut. Even though the AOS mentors claimed there were no water vapors in the exhaust line. After clearing the line and modify the exhaust line the butanol exhaust pump was found bad. After replacing the pump the observers Ben and David came up with a fix seen in the last 2 photos.

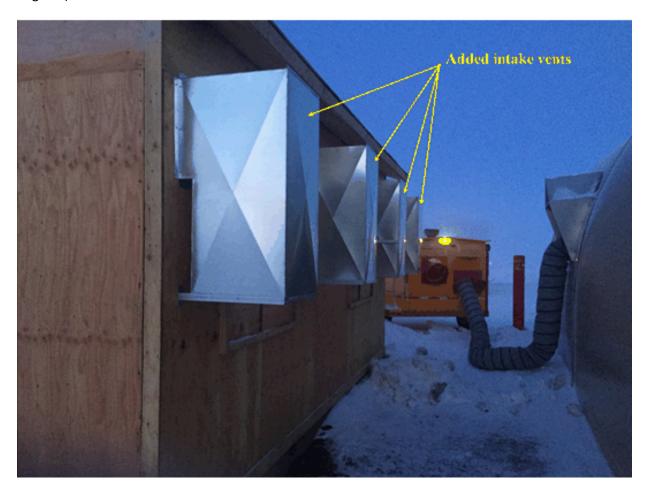








Overheating generator hooch: added four air intake vents and two power exhaust vents to the generator hooch. The power exhaust vents are thermostat controlled (on at 70 degrees and off at 60 degrees).







Unmet Needs

AMF3 still lacks a permanent source of power.

Site Upgrades

NA

Site Safety

NA

Site Staffing Issues

NA

Tethered Balloon Operations

- 1. TBS Operations over ICARUS was summarized in presentations at the UAS/TBS Working Group in Boulder on 1/11 1/12/17 and at the UAS Advisory Board Meeting in Battelle on 1/27/17. A poster concerning the TBS was presented at AMS in Seattle on 1/25/17.
- 2. Following the UAS/TBS Working Group, plans have moved forward to operate two POPS from the TBS in '17. Discussions with Handix and Fan Mei are ongoing regarding the TBS POPS box design. Two iMet radiosondes and equipment for two ground stations has been procured by SNL in order to operate the two TBS POPS.
- 3. At the UAS Advisory Board Meeting, the potential of operating Vaisala RS91 sondes on the TBS instead of or in addition to iMet radiosondes was discussed. Discussions are in progress with Donna Holdridge regarding the efficacy of this.
- 4. While attending the UAS/TBS Working Group meeting SNL staff met with NOAA scientist, Lars Kalnajs. Lars has operated a DTS system from stratospheric balloons, and has had some success with using a Princetel fiber optic rotary joint. The Princetel joint is comparatively inexpensive (\$1,000 each) compared to other joints considered. Matt Fladeland, a member of the UAS Advisory Board, recommended emailing a NASA colleague who has also successfully used a joint for DTS measurements. Discussions with all parties and vendors are ongoing to determine the best fiber optic rotary joint solution for the ARM TBS DTS.
- 5. A lab test of the Nichrome burn wire to separate the balloon and tether was successfully conducted. Balloon flights on Kirtland AFB in Albuquerque are planned for late February 2017 in order to test the burn wire and parachute deployment.

Figure 1: Lab burn wire test 1/24/17



Barrow

Current and Upcoming Site Visits

Todd Houchens/SNL 01/28-30/2017 Radar and ES&H work Dan Lucero/SNL 02/13-17/2017 Autolauncher support

Current and Upcoming IOPs

Sites, Baylor – June 2016 – Sept 2017.

COSMOS, Soil Moisture Probes, - Task order under CPA 1260749 for labor – POP Ends - 2016 SNPP/NPOESS Ground Truth Sonde Launch, Phase 5 – Started Oct 1, 2016 Sea Ice Effects on Arctic Climate, Rain sample collection - Dartmouth University – POP Ends Dec 2016 Seismic Probes for NSF– POP Ends, Oct 31, 2018 Carbon Aerosol/Methane Gas, - Task order under CPA 1260749 for labor – POP Ends – 2018 Multi-faceted Approach to Characterizing Potential Radiative Forcing on the NSA using Two Coastal

Site Issues

Auto Balloon Launcher currently having issues with outside launch doors hanging up, causing filled balloons not to launch. Ordered new oil-less compressor and new pneumatic lifts for launch doors, hope to have them installed in the next two weeks, until then, manual launches will continue.

Unmet Needs

Auto Launcher deck arrived; it is currently stored for installation in the spring.

Site Upgrades

NA

Site Safety

NA

Site Staffing Issues

NA

Distribution

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